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CHIPS FROM THE QUARRY

Merry Christmas and a Happy New Year

Christmas comes near the end of a year perhaps as a reminder that someday our sojourn on earth will also end.

As we march down through the corridor of time, we should pray fervently and unceasingly to Almighty God that He may guide us over the long and narrow path which leads to His Sacred Heart—the gateway to Heaven where eternity is one beautiful, joyful Christmas.

WATCH FOR THESE ARTICLES

During 1945 we plan to feature a number of interesting articles which had been prepared for *Rocks and Minerals*. Most of these should have appeared in 1944 but due to the greatly increased amount of advertising which encroached upon the reading matter (paper shortage prevented us from adding more pages) they were forced out.

Among the articles which we hope to print in the early part of 1945 are: Summary of Challenger Expedition Bottom Samples, by K. O. Emery; A Montana Corundum Mine, by H. E. Murdock; Some Minerals of the Galapagos Islands, by Pvt. Gabriel Dziadik; Diamond Head, Hawaiian Islands, by John S. Albanese; Some Mineral Localities in Rhode Island, by W. S. Winslow, Jr.; Concretions, by S. C. Edwards; Some Nevada Pickings, by A. Reeves; Topaz Around the World, by H. Y. Drake; My Easter Vacation, by B. M. Brehm; Amethyst-Smoky Quartz-Topaz in northern New Hampshire, by Harold J. Verrow. We will also try to print some lapidary articles, if room for them can be found.

We are deeply grateful to the authors of the above articles for their sympathetic patience and understanding why their articles failed to appear during 1944.

Lord's Hill, Me., Once Called Harndon

Editor R & M:

The article in the August issue on Harndon Hill topaz, I have found very interesting. I have been there several times and know the place well but I had to learn the hard way by going to Harndon Hill first.

The local people over there tell me there was a sort of mix-up in the names and that Lord's Hill was formerly called Harndon.

Mr. Slocum is right about the quality of the topaz. The man who worked it in the early 80's, Mr. Nathan Perry, was a keen observer and very little escaped his notice but he evidently thought there was more for he partially filled the hole before he left. I hope to see it opened again sometime.

The best way to reach the locality is from Lovell village, past the golf links, straight ahead over the "Narrows" at the foot of Kezar Lake—go as far as the car will pass and then walk about one mile and turn right on a mountain trail which goes over Lord's Hill—turn left at about 45° before you enter the woods near the top.

One slight error in his map. He should place the amethyst on Big Deer Hill, right on the C.T.A. trail. The amethyst here is mostly pale but pockets are numerous.

C. F. Marble,
Buckfield, Me.

Cape May Diamonds

Along the beach at Cape May, the extreme southern tip of New Jersey which projects into the Atlantic Ocean, water-worn pebbles of rock crystal have been found, a number of which have been cut and polished to form nice gems. These pebbles are called "Cape May diamonds."

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DANA'S SYSTEM OF MINERALOGY

A HISTORY AND REVIEW

By A. Pabst, University of California, Berkeley, California

Publication of the first volume of the new seventh edition of Dana's "System of Mineralogy"[1] gives occasion for a review of the history of this famous work which has enjoyed a longevity rarely found among scientific books. The jacket of this first volume carries, under the title, the phrase "Centennial Anniversary Issue 1844-1944", because the association of the publishers, John Wiley and Sons, with the "System" began one hundred years ago with the appearance of the second edition. The first edition had been published by James Dwight Dana in 1837 in New Haven. The succession of editions and supplements is best summarized in a table as follows:

Edition	*Appendix*	*Authors*	*Year*	*Pages Total*	*Pages Descriptive Mineralogy*
1		J. D. Dana	1837	585	287
2		J. D. Dana	1844	633	324
3*		J. D. Dana	1850	711	390
4*	##	J. D. Dana	1854	874	469
5		J. D. Dana & G. J. Brush	1868	875	805
"	I	G. J. Brush	1872		19
"	II	E. S. Dana	1875		64
"	III	E. S. Dana	1882		136
6		E. S. Dana	1892	1134	1049
	I	E. S. Dana	1899		75
	II	E. S. Dana & W. E. Ford	1909		114
	III	W. E. Ford	1915		87

As will be seen from this table the first four editions contained much besides a systematic description of minerals. They were really textbooks. After the fourth edition their function as such was taken over by the "Manual of Mineralogy," now in its fifteenth edition (by C. S. Hurlbut, 1941) and the "Textbook of Mineralogy" now in its 4th edition (by W. E. Ford, 1932). These books are then likewise descendants of the "System."

The first edition of the "System" was brought out by Dana soon after he became an assistant to Professor Silliman at Yale when he was but 24 years of age. It seems remarkable that one so young should have been able to

1) DANA'S "SYSTEM OF MINERALOGY," Seventh Edition, Volume I, Elements, Sulfides, Sulfosalts, Oxides. By Charles Palache, Harry Berman and Clifford Frondel, Harvard University. xii—834 pages. John Wiley and Sons, Inc., New York, N. Y. (1944). Price $10.00.

*G. J. Brush probably had a part in the preparation of the third and fourth editions, but his name does not appear on the title page before the fifth edition.

##Between 1854 and 1862 Dana and Brush published ten supplements in the *American Journal of Science*, but these were not, so far as known, bound or sold with the "System."

produce a work that soon drove all competitors out of the field. An examination of the early editions and their competitors quickly brings to light two important factors involved. Even when he wrote the first edition Dana had a comprehensive knowledge of the mineralogical literature of his day. Evidence of this is seen in the extended bibliography covering 18 pages in which are listed all important European works and the entire American literature in the field to date. This was expanded in the next edition to 23 pages.

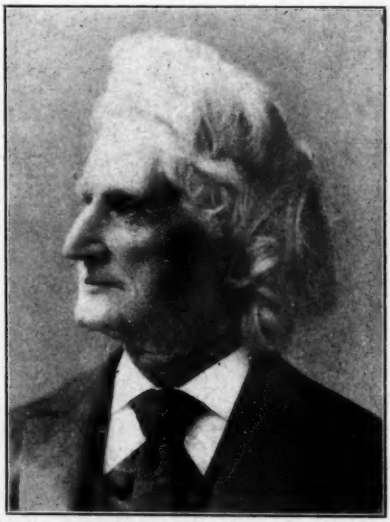
A second factor in the ultimate triumph of Dana's "System of Mineralogy" was the effort of the author to keep at all times strictly abreast of the advance of science, even though this required great alterations in the work and a radical change in his own views. In following how this worked out it is interesting to consider briefly other American mineralogies of those times.

Parker Cleaveland, professor at Bowdoin College, published his "Elementary Treatise on Mineralogy and Geology" in Boston in 1816 and a second edition of over 800 pages appeared in 1822. In spite of the title it is largely mineralogical and what little geology it contained soon became out of date. The author appears to have been a follower of Werner and not only argued for the aqueous origin of basalt, but even considered greenstone, granite and porphyry as "minerals, whose origin is undoubtedly aqueous."

Charles Upham Shepard was one of the most active contributors to mineralogy in the United States from 1829 when he published his first scientific paper until his death in 1885. From 1827 for four years he was an assistant to Silliman at Yale. In 1832 he published at New Haven the first part of his "Treatise on Mineralogy." In this he dealt with the study of minerals according to "the methods of Natural History," being largely influenced by Mohs and others who tried to continue the Linnaean tradition in mineralogy. The second part of this work appeared in 1835. Its 631 pages are entirely devoted to descriptive mineralogy. The mineral descriptions are arranged alphabetically and their crystallography is treated after the manner of Hauy. There is no bibliography. A second edition of the first part appeared in 1844 and a third edition of the entire work in 1852-57.

James Dwight Dana entered Yale in 1830, and studied under Silliman at the time when Shepard was his assistant. After three years he left to spend fifteen months as instructor in mathematics to the midshipmen of the United States Navy. Most of this time was spent on cruise and it is reported that "he occupied his leisure hours—working out—intricate problems of mathematical crystallography." Returned to Yale he became assistant in Chemistry to Professor Silliman and by May, 1837, still but 24 years of age, he had published at New Haven the first edition of the "System of Mineralogy," running to 585 pages, of which but 287 are devoted to descriptive mineralogy.

Dana also followed Mohs and



James Dwight Dana

adopted a "*Natural* Arrangement" of mineral species. So convinced was he of the advantages of a Linnaean system that he invented a binomial scheme of mineral nomenclature analogous to those of botany and zoology. He recognized classes, orders, genera and species, all supplied with names mostly of his own devising and Latin form. There were only three classes, to wit:

Class I Epigaea: Gases, unmetallic liquids, soluble minerals;

Class II Entogaea: Insoluble minerals not of vegetable origin;

Class III Hypogaea: Species derived from the alteration or decomposition of vegetable, or animal matter.

Obviously the great majority of minerals fall into class II. Class III contained only eight species, as listed in the first edition of the "System" and in class I Dana included a number of materials such as "sulphuric acid" and "phosphuretted hydrogen" which are no longer considered minerals.

The workings of the classification may be illustrated with an example showing the position and scope of one genus:

Class II Entogaea, insoluble, occur in or compose rock strata:

Order V Chalicinea, H=2-7, G=2.6-4. Lustre unmetallic. Streak uncolored.

Genus 6 Lazulus, H=5-6, G=2.8-3.1. Color blue or green. Cleavage indistinct.

Sp. 1. L. amorphous, *Turquois.*
2. L. rhombicus, *Lazulite.*
3. L. triclinatus, *Blue Spar.*

In the second edition the same classification and nomenclature were continued, but corrections were introduced where needed. So the genus Lazulus in this edition contained only two species, the third species, blue spar, having been recognized as merely a variety of lazulite.

It is seen that this classification was really derived from the schemes for identification of minerals from their physical properties first devised by Werner and Dana included extended tables based on these properties which could be used for purposes of identification. But Dana was well versed in other phases of mineralogy as well. The first 70 pages of his text are devoted to crystallography and crystallogeny and there is an appendix of 80 pages on "Mathematical Crystallography." In the section on "Determinative Mineralogy" there are two sets of tables, one based on the "Natural" arrangement and one in which minerals are grouped by crystal systems (which Dana at that time called "classes") under which they are segregated into those of unmetallic and those of metallic luster and then arranged in order of hardness. Similar tables are still found in certain modern books in determinative mineralogy.

At this time the rivals of the "Natural" classification of minerals by external features were the various chemical classifications. Studies in isomorphism and related phenomena had not yet gone far enough to show any extensive connections between chemical and crystallographic characters of minerals. Dana felt that his classification showed "in a considerable degree, the chemical relations of species." The example given above shows that this was true to a certain extent, and a close comparison of Dana's "System" with Cleaveland's "Mineralogy" published only 15 years earlier shows a truly remarkable progress. It was Dana's expectation that the rival systems would presently coalesce, but in the meanwhile he included a short chemical classification in an appendix.

In the descriptive portion of the work minerals are designated first by their usual names and Dana's generic and specific names are given only in small type. The minerals are numbered in the order in which they appear in the classification . Crystallographic description is in the form of Hauy. The "primary form" is stated and no mention is made of crystal system or symmetry. Chemical analyses are quoted for many minerals but no formulas are given.

The second edition, shows clearly the

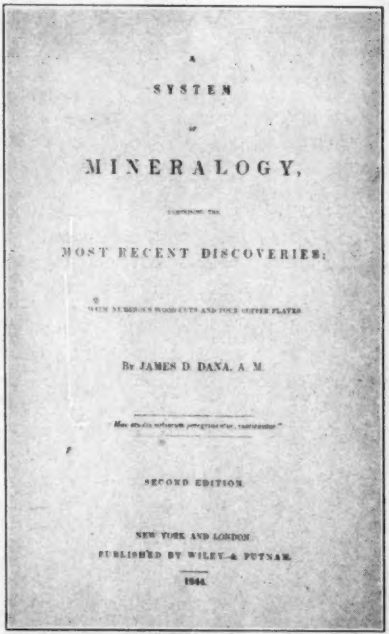
trend of the times in mineralogical thought, even though the classification and nomenclature of the first edition, issued only seven years before, were retained. The size of the work was only slightly increased and to make room for new material Dana dropped the long appendix on "Mathematical Crystallography." The most significant change was probably in the chemical classification, which, though still relegated to an appendix, was expanded from 6 to 23 pages and now included a chemical formula for each species. Strangely enough formulas were still omitted in the descriptive part.

The second edition introduced a new feature which has characterized all later editions up to the present, a "Catalogue of American Localities of Minerals." This first catalogue ran to 13 pages and included localities in 25 states, three with only one locality each, the most westerly being Missouri, but in the very next edition (1850) California was included, even though 19 states remained without representation. In the sixth edition (1892) the catalogue had grown to include all but four of the states and territories and ran to 45 pages for the United States and 7 pages for Canada.

The third edition marks Dana's break with the "Natural" classificaiton and it is worthwhile to quote his words in the preface: "To change is always seeming fickleness. But not to change with the advance of science, is worse; it is persistence in error; and, therefore, notwithstanding the former adoption of what has been called the "Natural History System," and the pledge to its support given by the author, in supplying it with a Latin Nomenclature, the whole system, its classes, orders, genera, and Latin names, have been rejected; and even the trace of it, which the synonymy might perhaps rightly bear, has been discarded." . . .

This cleared the way for -another classification, but Dana was well aware of the difficulties involved and realized that a better correlation of chemistry and crystallography would one day be possible. Accordingly he offered his new classification "simply as a convenient arrangement."

In accordance with this fundamental change in approach to the subject Dana made many other changes. Chemical formulas were introduced into the mineral descriptions. The description of crystallization in the manner of Hauy was discarded and the crystal system stated in many mineral descriptions. The extended bibliographies found in the early editions were discarded. Only a short list of major works in the subject was given, but some references to the original literature were included in mineral descriptions.



A

SYSTEM

OF

MINERALOGY,

MOST RECENT DISCOVERIES;

By JAMES D. DANA, A. M.

SECOND EDITION

NEW YORK AND LONDON
PUBLISHED BY WILEY & PUTNAM.
1844.

Title Page of the 1844 Edition of Dana's "System of Mineralogy"

In the fourth edition, published only 4 years later, Dana introduced a classification of minerals which in its major divisions has been followed by successive editions to this day. It is a combination of chemical and crystallographic classification. Within the major chemical divisions minerals are arranged in groups based either on

isomorphism or similarity of chemical formula or both.

Further great improvements were made in crystallographic description in the fourth edition. Though Naumann indices of crystal forms were mentioned in the crystallographic discussion of the first and third editions, the method of designating forms by indices was not employed in the mineral descriptions. In the fourth edition extended data on the forms of crystals are included for the first time. For all species rich in forms a diagrammatic summary of observed forms is given.

A greater interval of time elapsed before the appearance of the fifth edition (1868) and Dana was assisted in its preparation by George J. Brush, Professor of Mineralogy at Yale, well known for his book on "Determinative Mineralogy and Blowpipe Anaylsis," still the most comprehensive work in this field. With the fifth edition the "System of Mineralogy" took on a form similar to that in which it is familiar to present day mineralogists. All previous editions included extended discussions of the various phases of mineralogy and crystallography in addition to a descriptive part. In the fifth edition all but the descriptive part was dropped and this was provided with a short introduction designed only as an aid to the use of the descriptive part. This had now grown to 805 pages, over three times the length of the descriptive part of the first edition published only 31 years earlier.

In addition to the fundamental change in the scope and character of the work, many improvements were made in the mineral descriptions. The number of direct references to the original literature was greatly increased, while the bibliography in the introduction was enlarged from 4 to 11 pages. Optical data were included in the mineral descriptions for the first time, but were limited to fragmentary statements of orientation, optic sign and birefringence, no indices of refraction being given.

The publication of the fifth edition marked the end of James Dwight Dana's active connection with his famous work. An appendix to this edition was brought out in 1872 by Brush and more in 1875 and 1882 by Edward Salisbury Dana, the son of J. D. Dana. The first of these appendices covered the progress in mineralogy from 1868 to 1872 in a most imperfect fashion, but this was corrected in the later additions by E. S. Dana and so it was clear that he would be the proper man to prepare the next edition.

Though the sixth edition (1892) preserved the form and arrangement of the previous edition it showed many marked improvements. The format was enlarged, but in spite of this the number of pages of descriptive material increased by more than one quarter. Documentation was further greatly improved and many features of mineral description received a form similar to that still current. It is especially interesting to note that it was not until this 6th edition that chemical symbols were used in about the way we now use them, that indices of refraction were included among the optical data and that Miller indices were used for crystal forms, albeit the Dana form of Naumann indices was still given as well.

Appendices to the sixth edition by Dana and later by W. E. Ford appeared in 1899, 1909 and 1915 and brought the work more or less up to date but did not include any new types of data. In the introduction to the third appendix (1915) Ford refers to the study of crystals by X-rays as the "most important single new development" during the period covered, but he did not see fit to include any reference to the results, though he might well have given the cell dimensions and contents of several important minerals even at that time.

Soon after the publication of this last appendix to the sixth edition work was begun on a new revision. So large has been the task and so thoroughly and carefully has it been performed

that over a half a century has passed between E. S. Dana's sixth edition and the appearance of the first volume of the new seventh edition by Palache, Berman and Frondel. At first Professor Ford and Professor Palache at Harvard were to join in the revision, but in the course of time the work of revision was transferred entirely to Harvard and Professor Ford has not lived to see its completion. In the preface to the new edition Professor Palache gives a detailed statement of the history of the revision. Many have had a hand in it at Harvard and cooperation of mineralogists elsewhere was also obtained. Where critical data were lacking or needed revision new researches were undertaken at Harvard and practically the entire store of crystallographic data on minerals has been revised or recalculated and a new method has been invented for the convenient presentation of these data. Many of the results of this work have appeared as independent reports during recent years.

The system of classification in the new edition is based on crystal chemistry, but it turns out that this results in an arrangement very similar to that of the last two or three editions, which goes to show that mineralogical methods had led to results largely foreshadowing our present day understanding of the structure and relations of natural crystals.

The first volume of the new edition covers eight so-called classes :

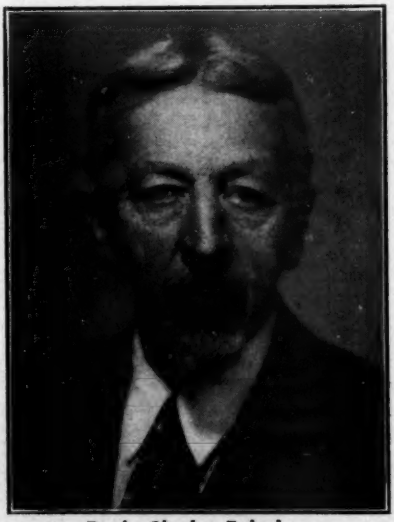
1. Native elements
2. Sulfides
3. Sulfosalts
4. Simple Oxides
5. Oxides of uranium, thorium, and zirconium
6. Hyrdoxides
7. Multiple oxides
8. Multiple oxides containing columbium, tantalum, and titanium

Those familiar with the sixth edition will recognize that most of these "classes" are the same recognized there, but many of the minerals now included in classes 5, 7, and 8 were formerly classed as oxygen-salts of various sorts.

Forthcoming volumes are to include the silicates with quartz in volume III and all other minerals in volume II. A check of the sixth edition shows that the minerals included in the present volume required for their description only about 240 of a total of 1,024 pages of descriptive materials. One must surmise that the two volumes yet to appear are likely to be larger than this first volume, the descriptive part of which occupies 722 pages.

The introduction to the new seventh edition serves the same purpose as the introductions to the last two editions, to explain the form of presentation and aid in the use of the mineral descriptions. Included in the introduction are 13 parts corresponding to the several parts of the mineral descriptions and there is an excellent bibliography of 35 pages more than double the length of that in the sixth edition.

The greatest part of the introduction, 32 pages, is given over to an explanation of the form of morphological description. This is entirely new and was, in part, especially devised for this edition. The symmetry of crystals is given by the class names of Professor



Prof. Charles Palache

A. F. Rogers of Stanford University and by the Hermann-Mauguin symbols which tie up so well with the symbolism used in structural crystallography.[2] Axial elements are given in a complete and consistent manner, explained in detail in the introduction. For each material linear, polar and projection elements are given. Crystal forms are designated by Miller indices and by letters that are used in a consistent manner. Tables of crystal forms and angles have been set up in a new manner. The form symbols and the letters are listed in a fixed order, with each are given the coordinate angles as they would be found in a two circle goniometer in two or more settings. In the tetragonal system, for instance ϕ and ρ are given and in addition the angle A to $a(100)$ and the angle M to $m(110)$. This requires four columns of angles, but combines with a table of two-circle angles many of the data desired by crystallographers accustomed to one-circle methods. In the monoclinic system six angles are given for each form. Minor forms are not included in the tables, but are listed separately.

Under the title "structure cell' a short paragraph giving information on the crystal structure is provided for those minerals where such data are available and it turns out that this now includes the great majority of the more important minerals. Where possible space group, cell dimensions and cell content are given. Correlated with this is a calculated value for the density given in the paragraph on physical properties. For many minerals new precision determinations of the density on small pure fragments made with the Berman balance (mostly by Frondel) are also given so that the data on density are really much improved. In a number of cases, not-

[2]Strange as it may seem this is the first edition of Dana in which the crystal class is given for a large number of minerals and in which any consistent and complete system for symmetry description is mentioned. Though the 32 crystal classes were derived by Hessel in 1830, seven years before the first edition of the "System" and became generally known to crystallographers after the work of Bravais in 1849 and Gadolin in 1871 it appears that Dana and his coworkers and successors before Palache had little interest in or understanding of these important matters.

The late Dr. Harry Berman

Dr. Clifford Frondel

ably chalcopyrite, marcasite and the arsenopyrite group, the setting and axial elements chosen for the morphological description are made to conform to the results of X-ray studies.

Melting points and inversion points are given under "Physical Properties" for all minerals for which such information is available and for sulfur even the boiling point is given; for many minerals the fusibility on the von Kobell scale is given in the paragraph on "Tests"; for a few both types of data are given and in still other cases neither. Unfortunately there is no comment on these matters in the introduction.

Data on optical properties are given not only for translucent materials but also, where available, for opaque minerals.

Mineralogy is burdened with a great number of variety names, synonyms and discredited mineral names. Over three thousand names are included in the index of the first volume. Of these less than 400 are printed in boldface type as names of "accepted species." No prominence is given to varieties in the new "System." They are discussed together with the principal minerals with which they belong, for the most part without separate description, and defined by chemical adjectives as suggested by Schaller. The best example of this treatment is found in the "tetrahedrite series." Synonyms and discredited names are included and explained with appropriate references to the original literature.

In every edition of the "System" analyses of minerals have been included where possible. Nowadays that means analyses for every acceptable species. Even though the quantitative analysis of minerals may be much less frequent now than it was a hundred years ago, newer analyses are often better not only because of advances in analytical technique, but especially because of the greater care now generally taken to obtain suitable clean material and improved methods of detecting contamination. This has made it especially desirable to reconsider the selection of analyses. For the mineral Jamesonite, for instance, 3 analyses, all by Gustav Rose, were quoted in the first edition. By the 6th edition the number of analyses of Jamesonite had grown to 8 but no analyses by Rose, from which the composition of the mineral was first established, were included. In the new edition there are but 7 analyses and only one of these is repeated from the previous edition; two are more recent analyses, three are older analyses of high quality not quoted in the sixth edition and one is an average of three analyses by Rose. These changes illustrate well some of the principles guiding the choice; *(a)* inclusion of the best modern analyses, *(b)* critical consideration of all older analyses and *(c)* inclusion, where possible, of the original analytical data establishing the formula. The case just cited shows that these points were sometimes sadly neglected in the 6th edition. For species or groups showing a significant range of composition analyses should of course be selected to show the range. This need was met in the sixth edition, but a refinement has been added in the new edition. The 44 analyses of the tetrahedrite series are preceded by a short table from which one can quickly find the maximum amount of each element shown by the analyses and the analysis in which it appears. Such tables would be useful for any of the more complex series and it is to be hoped that more of them will be included in the remaining volumes.

For many minerals a statement of the types of occurrence is given, "based chiefly on the classification and description in Lindgren's *Mineral Deposits*," but to keep down the size of the work only a selection of localities has been given under "Occurrence" for the more widespread minerals. "For the less common or rare minerals" localities are given as completely as possible. This may be illustrated by comparing the number of localities given for several minerals in the sixth and seventh editions:—

	6th	7th
Tellurium	7	15
Greenockite	9	13
Miargyrite	9	15
Delafossite	2	8
Tapiolite	1	8

There is no indication in the text for which minerals the list of localities is complete, but it seems likely that it is so for a majority of species. No references to original literature are given under the heading of "Occurrence," but documentation of the rest of the text is very full and for the rarer minerals references are probably given to every item ever published about them. Of this delafossite offers a good example. In the 6th edition there was but one reference for this mineral, the only one available. In the 7th edition there are six references out of a possible 8 known to the writer, but the localities referred to in these two additional references are included in the list of localities which seems to be complete to date.

Dana's "System of Mineralogy" has long been the "Bible" of mineralogists all over the world. There is no doubt that the seventh edition will hold the same important position as its predecessors. It continues the traditions of care, thoroughness, and progress which have kept the "System" preeminent for a century. All serious students of minerals will want to have the new "System" at hand constantly. Every public library and college should have a set. It is to be hoped that the misfortunes of war and the tragic death of Dr. Berman will not long delay the appearance of the remaining volumes.

Nice Jasper Pebbles Found at Eau Claire, Wisc.

Eau Claire is a city of about 35,000 population in western Wisconsin (in N.W. Eau Clair County) on the east bank of the Chippewa River. A member of the R.&M.A., Mrs. Palmer Tiller, lives in Eau Claire and she finds many interesting pebbles, chiefly quartz, in the bank bordering the river—in fact the exact locality is only 20 feet from her front yard. Her home is about a mile west from the heart of Eau Claire.

Smoky quartz, milky quartz, red jasper, pinkish microline, gray microcline, gray granite, pinkish pegmatite, and dark gray diabase are common in nice pebbles at the locality. The most interesting mineral, however, is red jasper which occurs in sizes from small up to 2x2 inches and over. There occur in pure masses of fine quality and should take an excellent polish. Some nice banded red jasper has also been found.

How nice it must be to have a gem jasper locality almost in one's front yard! When collector-friends call on you they would not only have the pleasure of examining your collection but also have the privilege of collecting nice jaspers at the same time.

Martite from Twin Peaks, Utah

Martite is an iron oxide (hematite) occurring in octahedral or dodecahedral crystals and pseudomorphs after magnetite. A famed locality for good specimens is Twin Peaks, near Kanosh, in southeastern Millard County (S.W. Utah). Many specimens have been found loose on the surface of the ground but finer ones occur in seams of rhyolite in the mountains. Some of the octahedral crystals of martite found have been more than 5 inches across but the more common size is about 1 inch. Dark green crystals of augite and nearly colorless crystals of apatite have been found associated with the martite.

Rainbow Rocks of Mexico, Pa.

Mexico is a little village in eastern Juniata County (of central Pennsylvania) on the south bank of the Juniata River. At Mexico is a large railroad cut in Silurian limestones. These limestone formations are beautifully folded and because of their concentric arches are called "the Rainbow Rocks." A good view of these rocks may be had from the road on the opposite side of the river which parallels the stream northward to Mifflintown.

HARRY BERMAN — AN APPRECIATION

There are many friends of mineralogy who never had the opportunity of knowing Harry Berman. It is chiefly for them that this brief appreciation is written, since all who knew him realize full well what was in him, both the stature of his contribution to mineralogy and what he added to the lives of his fellow men.

Harry Berman was one of the simplest and most human personalities that one could ever know. He had been a poor boy in the beginning, who had acquired a deep love for minerals and who had had to work his way upward in the science the hard way. The fact that he had reached the very top, the utmost pinnacle, never served to change his simplicity and his warmth of friendliness for others.

Those of us who were lucky enough to know him well, will never forget him as long as we live. I fear that very few of us ever fully appreciated how deeply we were attached to him until we heard that final, terrible news of his passing. You see, Harry was not one of those people, eminent in a science or in any walk of life, who made himself felt through brilliance of oral intellect. His conversation was like his mind, simple, informal and unassuming; but it was also filled with a radiant friendliness which always stayed in one's mind and heart long afterward.

So do not form your picture of him through his scientific accomplishments and his mental achievements alone, however great they were (and they were very great!); try to picture instead a heartfelt smile and the warmest greeting in the world, for there you are getting closer to his true character.

His brilliant contributions to mineralogy, as well as to many related sciences, his inspirational teaching at Harvard, his quite revolutionary Dana work, and finally his devoted and great accomplishments in making minerals help win the war—all of these are a known and written record. All who may choose mineralogy, or any science, as their profession hereafter, can gain inspiration from the example that he set, from the trail that he blazed. It is a shining example that will never dull with time. The memorial to him which is now drawing together the efforts of all who knew him, all who knew his work, all who shared his love for minerals from everywhere, will grow under the guidance of his spirit and, through its own outstanding contribution to the whole world of mineralogy, will help preserve for always the quality of his genius and the inspiration of his character.

For Harry Berman was more than a great scientist and very possibly the foremost mineralogist of his time, he was a man who had love for his fellow men deeply rooted in his soul, who never lacked a kind word for everybody and a helping hand for all. Which was the greatest accomplishment, do you think? Was it the trail of scientific accomplishment he blazed, or was it just something simple in his character? All of us who have been taught to pray know the answer.

Those of you who love mineralogy and did not know him, try to read about his work and better acquaint yourselves with the scope of his contribution to your science; but do not forget also that that was not his character nor the quality of his life. That was made up of little things, very little ones, like his smile and his handshake and what lay behind them. For the world of the heart and the spirit is the only true world that we know, however far we may deviate from their path. His path was one we shall not forget, however much we forget other things, for I do not think we shall see the like of him again.

—

The author, one of Dr. Berman's former students, prefers to remain anonymous, realizing that all who knew Harry Berman share in these feelings and will wish to join in this appreciation.

Photomicrographs Presented to Chicago Museum

Stuart H. Perry, publisher of the Adrian (Mich.) *Telegram,* has presented to the Library of the Chicago Natural History Museum a five-volume collection of photomicrographs of more than 100 meteorites. The photomicrographs were made during the course of Mr. Perry's "important and extensive studies of the metallography of meteoritic iron," states Paul O. McGrew of the Museum's Department of Geology.

The Smithsonian Institution has recently published an account of studies made by Mr. Perry of the microstructure of iron meteorites.

The five volumes contain more than 1,400 photographs accompanied by Mr. Perry's interpretation of the structure revealed. Only three such sets have been made and these have been distributed to the United States National Museum, the University of Michigan (where Mr. Perry conducted his studies), and to this museum.

Wavellite Near Mt. Holly Springs, Penn.

Mt. Holly Springs is a small village in southern Pennsylvania (in south Cumberland County). About 4 miles west of the village is the small settlement of Moore's Mills.

About 1¼ miles southeast of Moore's Mills occurs the only commercial deposit of wavellite in the country which has been mined for a number of years. Wavellite occurs at the locality on South Mt., as small white nodules and botryoidal masses in a white clay. Beautiful white radiating crystals have been found here to enrich many collections.

Beraunite, cacoxenite, and strengite, in nice specimens, have also been found at the locality.

Australia's Newest Tin Field

About 150 miles north of Tea Tree Well, a small community in the central part of Central Australia, is Australia's newest tin field. The mineral (cassiterite) occurs in placers which are located in such an arid region that water is not to be had and the ore must be concentrated by hand picking or by screening and dry blowing. Some unusually interesting crystals—a few being twinned—have been found in the field.

Tea Tree Well is about 100 miles north of Alice Springs, a somewhat larger community.

Gold Occurrence in North Australia

Darwin, on the northern coast of Australia, (in northwestern North Australia) figured prominently in the news a year or so ago and especially while it was being bombed by the Japs. About 100 miles southeast of Darwin (the largest city of the territory) gold is mined at a number of places and especially around Burrundie where it occurs in schists and granites. Copper, lead, tin, and tungsten mines also occur in the district.

Fine Jaspers from Esja, Iceland

At Esja, near Reykjavik, in southwestern Iceland, very fine reddish jaspers occur which take a nice polish. Sometimes the jaspers are encrusted with deep green moss agate which can likewise take a nice polish. The moss of the agate is deep green in color, the matrix is a creamy-white chalcedony.

Reykjavik is the capital and largest city of Iceland and is a seaport on the southwest coast.

Fluorescent Calcite from Pittsburgh, Penn.

Pale brownish massive calcite has been found in Pittsburgh, Penn., which fluoresces a nice pale green under the cold quartz lamp (Mineralight). It phosphoresces a pale greenish-white under the same light.

Pittsburgh is the second largest city in Pennsylvania.

. . . With Our Dealers . . .

Have you those two interesting minerals which are advertised this month by the West Coast Mineral Co. of La Habra, Calif? Better order them to make sure!

The H. S. Powell Co., of Little Rock, Ark., announces some Super minerals for Christmas. If you do not know what a super mineral is, order some to find out!

Ward's Natural Science Est., of Rochester, N. Y., have a new fluorescent scapolite from a Canadian locality that was mined for them during the past summer.

N. A. Sansteby, of San Gabriel, Calif., has a surplus of rough cutting material. How that surplus will dwindle after orders starting pouring in!

The list of minerals advertised during the past few months by Jno. B. Litsey, of Dallas, Texas, has created so much interest that it is repeated this month.

Arkansas rock crystal and Texas calcite are two outstanding minerals in the stock of Ozark Biological Laboratories, of Hot Springs National Park, Ark.

Fluorescent minerals and lapidary supplies —huge amounts of both—are in the stock of Warner & Grieger, of Pasadena, Calif.

Roland O. Betterley, of Pottstown, Penn., is speciallizing in minerals of S. E. Pennsylvania. He can supply specimens from many localities.

The Wiener Mineral Co., of Tucson, Ariz., is again featuring another assortment of excellent specimens for collectors.

The Colorado Gem Co., of Bayfield, Colo., wish to extend to all Rockhounds everywhere a Merry Christmas and a Happy, Prosperous New Year!

A new advertiser this month is W. T. Baxter, of Bethesda, Md., who is well-known throughout the country as the author of that very popular book "Jewelry, Gem Cutting and Metalcraft."

The Western Mineral Exchange, of Seattle, Wash., have 5 ads in this issue featuring books, lapidary outfits and supplies.

Another new advertiser this month is National Mineral Supplies, of Kenmore, Wash., who have an interesting Get Acquainted Special.

Some more beautiful Montana agates are featured this month by Yellowstone Lapidary, of Miles City, Mont.

B & I Manufacturing Co., of Burlington, Wisc., have a new gem facetor which should be of special interest to amateur cutters.

James Redding, of Grand Junction, Colo., another new advertiser, has some fine Utah Polka Dot Agate in stock.

Jess Abernathy, of Salt Lake City, Utah, also a new advertiser, will surely receive many nice orders for his gem smithsonite.

W. Edwin Troup, of Jordan Station, Ont., Canada, can furnish 3 interesting minerals from Bancroft, Ontario. He, too, is a new advertiser.

A. J. Harstad, of Helena, Mont., is continuing his new Streamlined Service in this issue.

Allan Branham, of Lander, Wyo., is with us again featuring another assortment of fine specimens.

The Eastern Mineral Exchange, of Bethlehem, Penn., have acquired some choice western minerals, some of which are featured in this issue.

Another new advertiser is A. L. Jarvis, of Watsonville, Calif. Mr. Jarvis is an outstanding collector who formerly resided in Dallas, Texas. We hope his first offer will intrique you.

Frank Duncan and daughter, of Terlingua, Texas, are featuring a Holiday Special of choice fluorescent minerals from their section of the country.

Still another new advertiser in *Rocks and Minerals* is that well known collector of quartz and inclusions in quartz, Mr. Nicola Goodwin D'Ascenzo, of Bala-Cynwyd, Penn. He doesn't want to sell any of his specimens, nor even to exchange them—he wants to buy *transparent* gem stones, rough or cut.

Suggestions for Christmas — by Schortmann's Minerals, of Easthampton, Mass. Their suggestions embrace 20 choice minerals from Europe and the Americas.

Chas. O. Fernquist, of Spokane, Wash., announces the purchase of the Seeber collection which consists of outstanding minerals from the copper country of Michigan.

Robt. Roots, of Denver, Colo., has another assortment of interesting Colorado minerals.

Christmas bargains in selected mineral specimens are featured by Everts L. Horton, of Bethesda, Md. Forty-two specimens of which 7 are gold are in the bargain group.

Fine mineral specimens for Christmas are offered this month by E. Mitchell Gunnell, of Denver, Colo. He lists some very interesting minerals.

And still another new advertiser is W. F. Tieman, of Chicago, Ill., who has for sale some fine Siberian emeralds.

Indiana geodes is the specialty of the month for James W. Riley, of Springfield, Ohio.

Bihar Mica District Most Important in India

The most important muscovite mica deposits in India are in the northeastern part of the country in the province of Bihar. The quality of the mica is considered the finest in the world and huge amounts are exported to the United States. The province produces about 75 to over 80% of the total production of mica in India.

The deposits occur in pegmatites found in mica schists and extend as a belt which runs in an east-north-easterly direction and covers an area of about 60 miles long and 12 to 14 miles wide, traversing obliquely the districts of Hazaribagh, Gaya, and Monghyr. A large number of the more important mines of this belt lie in or around the Kodarma Government Forest area. Many interesting minerals such as apatite, beryl, columbite, monazite, pitchblende, samarskite, tourmaline, triplite, xenotime, and zircon are found in the deposits.

REFERENCE

Handbook of Mica, by R. R. Chowdhury, Chemical Pub. Co., Inc., Brooklyn, N. Y. 1941, p. 116

Mt. Pico Turquino, Highest Point in Cuba

The highest point in Cuba is Mt. Pico Turquino, which is 8,397 feet high. It is located in the southern part of Oriente Province, the most easterly province of the island. The mountain is in the Sierra Maestra range which extends along the southern coast of the province. The range is composed mainly of volcanic rocks and limestones.

Mt. Pico Turquino is about 5 miles from the coast.

World's Finest Turquoise Comes from Persia

The finest turquoise known comes from the famous mines near the little village of Maden, 36 miles northwest of Nishapur, in the northern part of the province of Khorassan, in northeastern Persia. The mines, of which there are a large number, are on the southern slope of a range of hills (Meerabee Mts.) that rise from the broad open valley in which Maden is located.

The mines, which are at an elevation of 5,000 feet above sea level, are very ancient—having been opened up many years ago before the birth of Christ. The deposits are worked by means of shafts and tunnels and also as open cuts. The deposits occur in a porphyritic trachyte, the turqoise is found with limonite filling cracks and crevices in the trachyte.

The geographical location of Maden is 36° 15' N. Lat. and 58° 50' E. Long.

Mishapur sometimes appears in print as Nishapore and even as Nichabour.

Reference

The Turquoise, by Joseph E. Pogue, Ph.D., Nat. Acad. Sci., pp. 34-40.

St. Alyre Springs, France

Clermont is a city in south-central France (in the central part of the Department of Puy-de-Dome). On the northern outskirts of the city are the curious *Petrifying Springs of St. Alyre*. These springs are not only celebrated for their beautiful lime incrustations but if articles are deposited in them, they will, after a time, become coated with a deposit of finely granular snow-white calcite.

Club and Society Notes

Arkansas Mineralogical Society

The Arkansas Mineralogical Society held its 16th Annual Meeting at the Women's City Club, 401 Scott St., Little Rock, Ark., at 7:00 P.M. Wednesday, October 11th, 1944.

The meeting was well attended . A banquet dinner was served on a special arranged "Victory" table with a large American flag at the end.

There were sixteen very attractive and rare mineral exhibits on display. The annual cash prize for the best exhibit was awarded to Mr. Lawton Kimzey of Malvern, Ark., for his very rare and superb specimens of Brookite Crystals from Magnet Cove.

The door prize consisting of a genuine Arkansas Diamond Crystal mounted in Peridotite, presented by the H. H. Powell Company, was won by Mr. C. Stanfill of Morrilton, Ark.

Interesting talks were made by the following: Dr. H. E. Wheeler, Mineralogist of the Arkansas Geological Survey; Mr. R. P. Bryson, of the U. S. Geological Survey; Mr. Marcus I. Goldman, of the U. A. Geological Survey; Dr. J. R. Totter, of the U. of A. Medical School; Mr. Harry S. Pringle, Geologist of Little Rock; and C. D. Williams, Mining Engineer; Mr. L. B. Bosworth, mining man from Hot Springs National Park, Ark.

The following officers and trustees were elected for the ensuing year: Mr. W. G. Shockley of the U. S. Engineers, Little Rock, president; Mr. L. B. Pringle, Little Rock, vice-president; Byron C. Marshall, of Hot Springs, second vice-president; Dr. D. E. Fletcher, of the U. of A. Medical School, trustee; Mr. D. M. Stewart, trustee; Joe W. Kimzey, State Geologist, trustee; and Richard Buhlis, secretary-treasurer.

Rocky Mountain Federation Of Mineral Societies

Due to the war, no convention of the Federation was held this year but the Utah Section (Mineralogical Society of Utah) conducted a vote, by mail, for the election of a President. Mr. Arthur L. Flagg, of Phoenix, Ariz., who has been serving as President since the last convention held in Salt Lake City, Utah, two years ago, was unanimously re-elected to continue in office for another year.

Mr. Flagg, under the powers granted the President, appointed Mrs. Charles W. Lockerbie, of Salt Lake City, Utah, as Vice-President, and Mr. Humphrey S. Keithly, of Phoenix, Ariz., as the Secretary-Treasurer.

Fifteen societies make up the Federation.

Beautiful Onyx Found in Persia

In northwestern Persia, near the eastern shore of Lake Oroomiah, deposits of most beautiful semitransparent onyx occur which have been worked for centuries. The product was extensively used as a marble in the construction of buildings, tombs, fountains—some thin slabs were used in windows in place of glass. It was also very popular for ornaments. The onyx ranges in a combination of colors of yellow, green, red, blue, and white.

The quarries (near the village of Dehkharegan) are near the road which runs almost north and south between Maragha and Tabriz, being about 28 miles north of Maragha, or 44 miles south of Tabriz. This beautiful onyx marble has often been quarried in immense slabs.

Gallium First Identified in Sphalerite from France

The Pierrefitte mine is an argentiferous lead mine in southwestern France (in S. W. Department of Hautes-Pyrenees). It is located high above the east bank of the Gave de Cauterets, near the village of Pierrefitte in the valley of Argeles.

In this mine occurs massive sphalerite and it was in this mineral that gallium, a new element was discovered in 1875 by Lecoq de Bisbaudran. Gallium is a soft, bluish-white metal, easily cut with a knife, and possessing the remarkable property of melting when held in the hand and when melted it remains molten for some time.

Greenockite is often found as yellowish coating on the sphalerite from this mine.

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Official Journal of the Rocks and Minerals Association

A Magazine for Mineralogists, Geologists and Collectors

Merry Christmas and a Happy New Year

DECEMBER, 1944

25c

Vol. 19, No. 12 Whole No. 161

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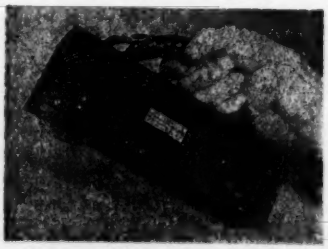

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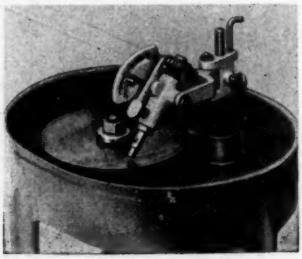

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Jingle Bells

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Good mineral specimens are hard to procure at the present time. This month I am rather fortunate in being able to announce that I have purchased the entire Seeber collection of Native Copper, Silver, Calcite with Copper Inclusions, Datolite, Analcite and associated minerals of the Michigan Copper Dstrict. This is an old time collection, collected by a former mine superintendent; over a period of many years. From the listing of specimens I notice that nearly all are crystallized.

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When the collection arrives, I will be ready to fill orders. The price range will be $1.00 to $75.00. For first choice, state minerals desired and send price of specimens in above range. The best at the price will be sent.

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GOLD NUGGETS—LaGrange Mine, Trinity County, Calif. All unusually crystalline and bright, 3.9 grams, **$5.00;** 1.7 grams, **$2.50;** 1.5 grams, **$2.00;** 0.75 grams, **$1.00.**

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SPHALERITE XLS—Near Rawlings, Wyo. Aggregate of large Xls that fluoresce rich golden color under long-wave ultraviolet, with fine pyrite and larger quartz Xls. .A showy specimen from a new U. S. locality, 4x4x2½", **$3.50.**

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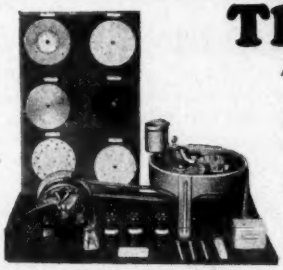

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DATOLITE—Westfield, Massachusetts. Section of a vug lined with brilliant crystals many of which are transparent. An "old timer". Size 4"x7"x2", **$7.50.**

BARITE—Bigrigg Mine, Egremont, Cumberland, England. One large double-terminated crystal about 2"x3½" and several smaller bluish crystals on matrix 4"x4½", **$8.50.**

SMOKY QUARTZ and MICROCLINE—Crystal Peak, Colorado. Group of smoky quartz crystals on flesh-colored amazonite crystals. Size 4"x5", **$7.50.**

AZURITE—Bisbee, Arizona. Specimen covered with small bright crystals. Size 4½"x4½", **$12.50.**

SULPHUR—Girgenti, Sicily. Group of crystals on matrix 4"x4", **$12.50.**

FLUORITE—Weardale, Cumberland, England. Group of transparent pale purple cubic crystals. A brilliant fluorescent specimen. Size 3"x5", **$7.50.**

CHALCOCITE—Bristol, Connecticut. Crystals on small white calcite crystals. A good old specimen that is rarely seen now. Size 3½"x3½", **$4.50.**

SMITHSONITE—Laurium, Greece. A light blue botryoidal mass 3½"x6", **$4.00.**

HEMATITE and QUARTZ—Cleator Moor, Cumberland, England. Stubby smoky quartz crystals with specular hematite crystals on matrix 3½"x4½", **$7.50.**

APATITE—Renfrew Co., Ontario, Canada. Large brownish roughly terminated crystal. Size 2½"x4½", **$4.00.**

AGATE—Uruguay. A polished slab of red, white and brown fortification agate. Size 3"x6½"x⅝", **$7.50.**

QUARTZ—Ellenville, New York. Mass of well-formed terminated crystals. Another "old timer". Size 3½"x6", **$3.00.**

GARNET var. Andradite—Graham Co., Arizona. Group of sharp greenish crystals on massive garnet. Size 3"x4", **$4.00.**

EPIDOTE—Prince of Wales Island, Alaska. Choice group of thick twinned crystals on matrix 2½"x3½", **$8.75.**

VARISCITE—Fairfield, Utah. A nicely polished half of a variscite nodule. Each section of variscite is bordered by a fine blue-gray band of wardite. Size 4"x6", **$12.50.**

The above prices do not include postage.

Schortmann's Minerals

6 McKinley Avenue **Easthampton, Massachusetts**

New Fluorescent Scapolite

Ward's offers a new Canadian Scapolite that fluoresces a gorgeous golden yellow when activated by ultra-violet radiations. This Scapolite is in fresh large masses the material having been mined for us this past summer. The approximate sizes of the specimens and their prices are: 2 x 2", **$.50**; 2 x 3", **1.00**; 2½ x 3½", **1.50**; 3 x 4", **2.00**; 4 x 5", **3.00**; 4½ x 5" to 4 x 6", **3.50, 4.00** and **5.00**; 4½ x 6½ x 2½", **7.50**; 5½ x 6½ x 2½", **10.00**; 8 x 9¼ x 3", **20.00.**

Other Fine Mineral Specimens

CERUSSITE, TSUMEB, SOUTH WEST AFRICA. Choice specimens consisting of large twin crystals on rock, 2¼ x 4", $10.00; 4 x 5", **$17.50.**

ATACAMITE, NEW SOUTH WALES. Large dark green crystals on rock, 3 x 5", **$12.50.**

PINAKIOLITE, Sweden, small tabular crystals in rock, 1¾ x 3¾", **$3.00.**

CHRYSOBERYL, Connecticut. Small green twinned crystals embedded in rock, 2½ x 2½", **$3.50.**

RUTILATED QUARTZ, Brazil. The rutile needles are in an incomplete large quartz crystal. It is a nice cabinet specimen size, 3½ x 6½ x 3½", **$15.00,** 20% Federal Tax.

AZURITE, Arizona. An interesting specimen of drusy azurite with malachite, 2¾ x 3", **$4.00.**

BEMENTITE, Franklin, New Jersey. A polished specimen of radiated bementite with calcite and franklinite, 2½ x 4¼", **$3.00.**

CANON DIABLO, Arizona, Meteorites. Excellent complete masses of iron from the famous Meteor Crater locality. No. 1, 1739 grams **$27.00**; No. 2, 2505 grams, **$30.00**; No. 3, 2730 grams **$35.00.**

AMBER, CEDAR LAKE, MANITOBA. Small amber pebbles in 1 x 2" vial. **$1.00,** 20% Federal Tax.

SCHEELITE, CALIFORNIA. Choice colorless clear crystals averaging in size, ⅜" to ½". Ten for **$1.50.**

WARD'S NATURAL SCIENCE ESTABLISHMENT

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